

Commonness of Reiterate Breeder in Dairy Cattle in Gondar, Ethiopia

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Abstract: The study was conducted from September 2010 to January 2011 to know the prevalence of repeat breeder dairy cattle in Gondar town artificial insemination service center. In this study 384 dairy cattle have been inseminated. Among these 9 heifers and 18 cows are repeat breeding during the investigation period. The prevalence of repeat breeder totally was 7.03 % but in terms of parity heifer 22.5% and cow 5%. All of the animals had repeated at least three times. A total of 357 animals (heifers 31 and 326 cows) were inseminated once, 12-18 hours after the start of estrus and were kept as control. This study showed that the highest prevalence of repeat breeders was seen among the heifers.

Key words: Cows • Heifer • Parity • Repeat Breeder • Gondar

INTRODUCTION

Ethiopia has the largest livestock population in Africa. This livestock sector has been contributing considerable portion to the economy of the country and still promising to rally round the economic development of the country. Livestock plays an important role in providing animal protein to improve the nutritional status of the people, giving export commodities to earn foreign exchanges to the country. Ethiopia is having total population of: Cattle heads: 49297898; Sheep: 25017218; Goats: 21884222; Horses: 1787 211; Donkeys: 5421895; Camels: 759696 [1]. It is needless to say that this huge valuable livestock population requires quality health coverage.

Despite the huge resource, Ethiopia's livestock productivity is lower than the Africa's average. The major biological constraints contributing to low productivity include low genetic potential of the animals, poor nutrition and the prevailing animal diseases [2,3] and reproductive failure due to ovarian dysfunction, disorder of fertilization, pregnancy wastage [4,5]. According to the above mentioned challenge reproductive failure which is one of the constraints impending full to repeat breeding. The repeat breeding cow is one that has clinically normal reproductive tract with normal or nearly normal oestrous cycles and oestrus periods and has been bred two or more times to a fertile bull but failed to conceive [6].

Repeat breeding is a substantial problem in cattle breeding leading to large economic loss for the dairy producer due to more inseminations, increased calving interval and increased culling rates [7].

Incidence of repeat breeding in cows in various countries ranged from 5.5 to 33.33% [8]. Potential causes of repeat breeding include sub-clinical infection of reproductive tract [7,9], age of the animal [4,10], failure of estrous detection [11], endocrine dysfunction [12], nutritional deficiencies and others [13,14]. Incidence of fertilization failure is approximately 10% and early embryonic deaths within 3 weeks accounts 30% leading to a total early pregnancy loss approximately 40% [15]. This means that on average 40% females will return to estrus after each AI or mating. Several environmental factors e.g. nutrition, climate, as well as intrinsic animal factors have been suggested to be the cause behind this early embryonic loss in cattle [16].

It has also been proposed for the repeat breeder cows suspected to have an infectious etiology; many of the treatments used have been in the form of uterine infusions with a variety of antiseptic and antibiotic solutions. The intrauterine infusions in repeat breeders have proven to be successful. Therapeutic use of GnRH and PGF2 α for repeat breeders has been demonstrated with some improvement in pregnancy rate compared to untreated [17,18].

Eventhough, the problem of repeat breeder is a major problem for our dairy cattle; only limited researches have been done on this major issue. Therefore, the objectives of this study were to determine the prevalence of repeat breeder and to identify age and parity group of dairy cattle more prone to infertility in Gondar town.

MATERIALS AND METHODS

The livestock population in the woreda includes Bovine 72979 (cow 27185 and heifer 11889), Ovine 2567, Caprine 21515, Equine 9588 and poultry 88408. Apart from this, the region receives a bimodal rainfall with an average annual rainfall rate of 1000mm that comes from the long and short rainy seasons [1].

Study Animals: All dairy cow species of domestic animals owned by selected households and farm animals brought to Gondar University Veterinary clinic, Woreda clinic and AI service station for insemination of superior bulls distributed by the national AI center at Kaliti.

Equipments and Tools: Different equipments and materials that are used to conduct this study including liquid nitrogen container, liquid nitrogen, thermometer, warm water, semen in straw, scissor, towel, AI sheath, gloves, swab, media, microscopic slides and light microscope. The teaser bull available in the University dairy farm was also utilized for this purpose.

Study Design: During the conducted time cross-sectional was design to determine the prevalence of repeat breeder in heifers and cows in Gondar town by using observation analytical study and giving AI service for the community who came to AI station. At this time special attention was paid to isolate the more exposed age group for repeat breeder. In addition to this, in order to isolate the bacteria that causes repeat breeder, culture and biochemical test was conducted in microbiology lab.

Sample Size Determination and Sampling: Purposive sampling: where the most desired sampling units are selected. The sample was taken by detection of heat, inseminating and record keeping from heifer and cow during standing heat. Hence about 384 samples have been collected. Among these 40 and 344 are heifers and cows respectively. While immediately after insemination those conceived were 357 while those returned to heat was 27. While giving semen for these repeat breeders for the second time it was properly followed and found

twentyseven cases which showed repeat breeding three or more times. From which four repeat breeders have been selected randomly for further investigation. therefore, cervical swab or uterine discharge has been submitted to microbiological examination. The dairy cattle were examined by history taking, external inspection and rectal examination to detect whether the animal is normal or not.

The sample has already collected from 344 cows and 40 heifers which are coming to the AI service stations of Gondar town at University of Gondar veterinary clinic and woreda clinic to be inseminated during standing heat time.

Data Analysis: The data collected from the study were recorded in excel sheet for descriptive analysis. Chi square test was used to compare the significant level of risk factors.

RESULTS

Prevalence: Repeat breeding has long been considered as one of the most important reproductive disorders in cattle. In this study, 27 repeat breeders were observed from the total of 384 samples. Among these, 9 heifers returned to heat out of 40 and 18 cows returned to heat out of 344. The total prevalence of repeat breeders in Gondar town was 7.03% out of the 384 animals studied.

The prevalence of repeat breeders among heifers from the total of 40 was seen in 9 (22.5%). Similarly the repeat breeders from the total of 344 cows were seen in 18 (5.23%). In this study, three or more services have been taken as repeat breeders. From 27 repeat breeders 92.6% are with 3 services while the rest 7.4% are with 4 services. This led to economical loss to the country as well as stake holders by losing the expected calves and milk production. The prevalence of repeat breeder significantly associated with the age of the animal in which the prevalence was higher among heifers (Table 1).

Bacteriological Finding: Microbiological examination revealed *E. coli* and *Staphylococcus* isolates from the cervix. But those bacterias are normal flora found in the cervix and this may not be considered as pathogens which cause the disease.

Rectal Palpation: During rectal palpation of the dairy cows in standing heat, two cows showed problems associated with tumor in the body of uterus and follicular cyst. The tumor was firm and hard up on palpation. On the other hand the appearance of follicular cyst was enlarged, round, soft and blistery during examination.

Table 1: The prevalence of repeat breeders in dairy cows in Gondar areas

Type	Repeat breeders	conceived	Total	Repeat Breeders %
Heifers	9	31	40	22.5
Cows	18	326	344	5.23
Total	27	357	384	7.03

Table 2: Prevalence of repeat breeders in dairy cows based on parity

Parity dairy	Repeat Breeders	conceived	Total Animals	Repeat Breeders (%)
1 st	2	62	64	3.12%
2 nd	8	151	23	5.03%
3 rd	0	78	78	-
4 th	6	24	30	23.07%
5 th	1	8	9	11.11%
6 th	0	4	4	-
7 th	1	1	2	50.0%
8 th	0	1	1	-
9 th	0	1	1	-
10 th	0	1	1	-
Heifers	9	31	40	22.5%

The prevalence of repeat breeders was highest in the seventh parity (50%) and lowest in the first parity (3.12%). As parity increased risk of repeat breeders was also increased.

DISCUSSION

The study showed that the prevalence of repeat breeding was more in heifers compared to cows. Earlier Hafez [5] was stated that full reproduction is not attained in any species at the first estrus or ejaculation. In addition there is a period of “adolescent sterility”, that period is remarkably short (some weeks) in domestic animal as compared to human (1 year or more). The present finding is in agreement with the above findings.

Repeat breeder is a major source of economic wastage in dairy herds country wise as the parity increased. This finding is in agreement Ergene and Bartlett *et al.* [19, 20]. The parity had direct association on the occurrence of reproductive problem which is in agreement with Molalegne and Shiv [21]. The prevalence of repeat breeder in Gondar was 7.03% and the finding is in correlation with Molalegne and Shiv [21] they have reported 7% incidence around Bedelle, South West Ethiopia based on questionnaire. Where as, in the present study cross-sectional observational analysis was used.

Out of 384 cases observed in the study, one repeat breeder heifer was found with follicular cyst problem which is in corroborate with the idea of Hafez [5] who stated that follicular cyst under go cyclic change.

During the bacterial finding by taking cervical swab sample and culturing *E.coli* and/or *Staphylococcus* was not a causative agent, unless if any pathological changes of the reproductive organ because such bacteria live in hollow organs as normal micro flora that many cause any effect on fertilization rate.

The prevalence of repeat breeder in Gondar town dairy cows was 7.03%. There was no investigation previously done on the prevalence of repeat breeder in Gondar. This study has attempted to show which age group is more exposed to repeat breeding by comparison. Among the 40 heifers observed 22.5% were repeat breeders and among the 344 cows 5.23% were repeat breeders. This implies heifers are more prone for repeat breeding in higher degree than cows. This is in conformity with Hafez [5] who has also stated that the early development of bovine embryo is impaired in uterine environment of repeat breeding heifer.

According to Kimura *et al.* [22] the incidence of repeat breeding in cows in various countries, ranged from 10 to 18%. Where as, in the present study, at Gondar the prevalence of repeat breeding was only 7.03%. The reduction in prevalence or incidence in Gondar town was due to the timely culling or slaughtering the repeaters after fattening. The beef market is well established and the animal owners get a reasonably good price by the way of sales. Hence, the treatment of repeat breeding problem has not been practiced elaborately.

CONCLUSION

Repeat breeding is one of the infertility problems which reduce the productivity and economic efficiency of dairy cattle. Most of the repeat breeders are not sterile; rather they suffer from lowered fertility. Repeat breeders should be carefully evaluated in order to define the most probable reason for the failure to conceive (early repeats) or failure in pregnancy maintenance (early and late repeats).

This study provided useful insight into risk factors for repeat breeding prevalence in Gondar dairy cows and the prevalence of repeat breeding in Gondar town is currently 7.03%. It is one aspect of infertility which results by different causes such as failure of fertilization, early embryonic death, congenital or genetic anatomical, defects of genital tract, defects of ova, defect of spermatozoa, inflammation in uterine tract, endocrine dysfunctions, managerial and nutrient deficiency.

The study impressed to ensure which age group of dairy is prone to return to heat frequently. Among the heifers 22.5% of samples are repeat breeders and among the cows 5.23% of samples are repeat breeders. From this result it is very clear that the prevalence of repeat breeding higher in heifers due to inseminating at puberty period on the first sign of oestrus and hormonal secretion.

The distribution of local and cross breeds in Gondar town was 30 and 354 respectively, where as the distribution showed the majority are cross breeds especially *Holstein Friesian* due to the strategic plan of the country to improve production efficiency of local breeds.

Recommendation: Heat detection training should be given for small holders and farm attendants to have successful conception rate.

- Culling of repeat breeders more than three services
- Proper handling of semen
- Inseminating should be done after 8 hours on set of standing heat for exotic breed and at 4 hours after on set of standing heat for zebu cattle.

When the heifers come to heat for the first time, the first heat should be missed without insemination. This is to give time for the genitalia to grow fully and also for the heifers to reach 70% of their mother's body weight.

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